

AMENDMENTS TO THE SPECIFICATION

Please replace paragraphs [0048] through [0052] as follows:

[0048] The following table is from Renkvist *et al.* (2001).

Table 1 Class I HLA-restricted cancer/testis antigens. All these antigens were found to be expressed by normal spermatocytes and/or spermatogonia of testis. Occasionally *MAGE-3*, *MAGE-4* and the *GAGE* genes were found to be expressed also in placenta (De Backer *et al.*, 1999; Cox *et al.*, 1994). The NY-ESO-1 antigen was found to be expressed in normal ovary cells (Chen *et al.*, 1997).

| Gene | HLA allele | Peptide epitope | Authors | Tissue distribution among tumors ^a |
|--------------------------------------|------------|--|-------------------------------|---|
| <i>MAGE-A1</i> | A1 | EADPTGH- SY | Traversari <i>et al.</i> 1992 | Melanoma, breast carcinoma, SCLC (De Plaen <i>et al.</i> , 1999); De Smet <i>et al.</i> , 1994, van der Bruggen <i>et al.</i> , 1994a) – sarcoma, NSCLC |
| <i>MAGE-A1</i> | A3 | SLFRAVI- TK | Chaux <i>et al.</i> 1999a | (De Plaen <i>et al.</i> , 1999), De Smet <i>et al.</i> , 1994) – thyroid medullary |
| <i>MAGE-A1</i> | A24 | NYKHCFP- EI | Fujie <i>et al.</i> 1999 | carconoma (van der Bruggen <i>et al.</i> , 1994a) – colon carcinoma (De Plaen <i>et al.</i> , 1999) – laryngeal |
| <i>MAGE-A1</i> | A28 | EVYDGR- EHSA <u>(SEQ ID NO:15)</u> | Chaux <i>et al.</i> 1999a | tumors (De Smet <i>et al.</i> , 1994) |
| <i>MAGE-A1</i> , -A2, -A3, -A6 | B37 | REPVTKA EML (<u>SEQ ID NO:16</u>) | Tanzarella <i>et al.</i> 1999 | Melanoma, colon and breast carcinomas, SCLC (De Plaen <i>et al.</i> , 1999, De Smet <i>et al.</i> , 1994, van der Bruggen <i>et al.</i> , 1994a) – sarcoma, NSCLC (De Plaen <i>et al.</i> , 1999, De Smet <i>et al.</i> , 1994 – thyroid medullary carcinoma, H/N tumors, bronchial SCC (van der Bruggen <i>et al.</i> , 1994a) – laryngeal tumors (De Smet <i>et al.</i> , 1994) – leukemias (De Plaen <i>et al.</i> , 1994) |
| <i>MAGE-A1</i> | B53 | DParYEF- LW | Chaux <i>et al.</i> 1999a | Melanoma, breast carcinoma, SCLC (De Plaen <i>et al.</i> , 1999, De Smet <i>et al.</i> , 1994, Van den Eynde <i>et al.</i> , 1999) – sarcoma, colon |
| <i>MAGE-A1</i> | Cw2 | SAFPPTIN- F | Chaux <i>et al.</i> 1999a | carcinoma, NSCLC (De Plaen <i>et al.</i> , 1999, De Smet <i>et al.</i> , 1994) – thyroid medullary carcinoma (van |
| <i>MAGE-A1</i> | Cw3 | SAYGEPR- KL | Chaux <i>et al.</i> 1999a | |
| <i>MAGE-A1</i> | Cw16 | SAYGEPR- KL | van der Bruggen <i>et al.</i> | |

| | | | | |
|-----------------|------|---|---|---|
| | | | 1994b | der Bruggen <i>et al.</i> , 1994a) |
| <i>MAGE-A2</i> | A2 | KMVELV- HFL | Visseren <i>et al.</i> 1997 | Melanoma, colon and breast carcinomas, SCLC (De Plaen <i>et al.</i> , 1999, De Smet <i>et al.</i> , 1994, van der Bruggen <i>et al.</i> , 1994a) – sarcoma, NSCLC (De Plaen <i>et al.</i> , 1999, De Smet <i>et al.</i> , 1994) – thyroid medullary carcinoma (van der Bruggen <i>et al.</i> , 1994a) – laryngeal tumors (Lurquin <i>et al.</i> , 1997) – leukemias (De Plaen <i>et al.</i> , 1999) |
| <i>MAGE-A2</i> | A2 | YLQVFGI- EV | Visseren <i>et al.</i> 1997 | |
| <i>MAGE-A2</i> | A24 | EYLQLVF- GI | Tahara <i>et al.</i> 1999 | |
| <i>MAGE-A3</i> | A1 | EADIPIGH LY(<u>SEQ</u> <u>ID NO:17</u>) | Gaugler <i>et al.</i> 1994 | Melanoma, colon and breast carcinomas (De Plaen <i>et al.</i> , 1999, van der Bruggen <i>et al.</i> , 1994a) – H/N tumors (Chen <i>et al.</i> , 1997) – bronchial SCC, thyroid medullary and bladder carcinoma, sarcomas, SCLC, NSCLC, (van der Bruggen <i>et al.</i> , 1994a) – leukemias (De Smet <i>et al.</i> , 1994) |
| <i>MAGE-A3</i> | A2 | FLWGPR- ALV | van der Bruggen <i>et al.</i> 1994a | |
| <i>MAGE-A3</i> | A24 | TFPDLES- EF | Oiso <i>et al.</i> 1999 [| |
| <i>MAGE-A3</i> | A24 | IMPKAGL- LI | Tanaka <i>et al.</i> 1997 | |
| <i>MAGE-A3</i> | B44 | MEVDPIG- HLY (<u>SEQ</u> <u>ID NO:18</u>) | Hermann <i>et al.</i> 1996 Fleischhauer <i>et al.</i> 1996 | |
| <i>MAGE-A3</i> | B52 | WQYFFP VIF | Russo <i>et al.</i> 2000 | |
| <i>MAGE-A4</i> | A2 | GVYDGR EHTV (<u>SEQ ID</u> <u>NO:19</u>) | Duffour <i>et al.</i> 1999 | Melanoma, NSCLC, sarcomas, esophageal, colon and breast carcinomas (De Plaen <i>et al.</i> , 1999) |
| <i>MAGE-A6</i> | A34 | MVKISGG PR | Zorn and Hercent, 1999b | Melanoma, NSCLC, colon carcinoma, leukemias (De Plaen <i>et al.</i> , 1999) |
| <i>MAGE-A10</i> | A2 | GLYDGM EHL | Huang <i>et al.</i> 1999 | Not defined |
| <i>MAGE-A12</i> | Cw7 | VRIGHLY IL | Panelli <i>et al</i> 2000 Heidecker <i>et al.</i> 2000 | Melanoma, myeloma, brain tumors, sarcoma, leukemias, SCLC, NSCLC, H/N tumors, bladder, lung, esophageal, breast, prostate and colorectal carcinoma (De Plaen <i>et al.</i> , 1994) |
| <i>BAGE</i> | Cw16 | AARAVFL AL | Boer <i>et al.</i> 1995 | Melanoma, bladder and mammary carcinomas, H/N SCC, NSCLC, |

| | | | | |
|---|-----|---|--|--|
| <i>DAM-6, -10</i> | A2 | FLWGPR AYA | Fleischhauer <i>et al</i> 1998 | sarcoma Melanoma, skin tumors, mammary and ovarian carcinomas (Lurquin <i>et al.</i> , 1997) – lung carcinoma (Dabovic <i>et al.</i> , 1995; Lurquin <i>et al.</i> , 1997) – seminomas (Dabovic <i>et al.</i> , 1995) |
| <i>GAGE-1, -2, -8</i> | Cw6 | YRPRPRR Y | Van den Eynde <i>et al.</i> 1995 De Backer <i>et al.</i> 1999 | Melanoma, sarcoma, NSCLC, SCLC, mesothelioma, sarcoma, seminoma, leukemias, lymphomas, H/N tumors, bladder, esophageal, mammary, colon, prostate carcinomas |
| <i>GAGE-1, -4, -5, -6, -7B</i> | A29 | YYWPRP RRY | De Backer <i>et al</i> 1999 | Melanomas, H/N tumors, leukemias, esophageal, lung and bladder carcinomas |
| <i>NA88-A</i> | B13 | MTQGQH FLQKV <u>(SEQ ID NO:20)</u> | Moreau-Aubrey, <i>et al.</i> 2000 | Melanoma |
| <i>NY-ESO-1</i> | A2 | SLLMWIT- QCFL <u>(SEQ ID NO:21)</u> | Jäger <i>et al.</i> 1998 | Melanoma, sarcoma, B-lymphomas, hepatoma, H/N tumors, bladder, lung, prostate, ovarian, thyroid and breast carcinoma (Chen <i>et al.</i> , 1997) |
| <i>NY-ESO-1_a (CAG-3)</i> | A2 | SLLMWIT- QC | Jäger <i>et al.</i> 1998 | |
| | A2 | QLSLLM- WIT | Jäger <i>et al.</i> 1998 | |
| | A31 | ASGPGGG- APR (SEQ ID NO:22) | Wang <i>et al.</i> 1998b | |

^aTissue distribution among tumors as described in the given references when different from the paper first reporting the sequence of the epitope.

[0049] The following table is from Renkvist *et al.* (2001).

Table 2 Class I HLA-restricted melanocyte differentiation antigens. These antigens can only be expressed in normal and neoplastic cells of the same lineage (namely melanocytes, skin, retina, peripheral ganglia) or in normal cells of the prostate gland.

| Gene | HLA allele | Peptide epitope | Authors |
|-----------------------------------|------------|--------------------------------------|------------------------------|
| <i>MART-1/Melan-A^a</i> | A2 | AAGIGILTV | Coulie <i>et al.</i> 1994 |
| | A2 | EAAGIGILTV <u>(SEQ ID NO:23)</u> | Kawakami <i>et al.</i> 1994a |
| | A2 | ILTVILGVL | Schneider <i>et al.</i> 1998 |
| | | | Castelli <i>et al.</i> 1995 |

| | | | |
|--|-----|-------------------------------------|-----------------------------------|
| | B45 | AEEAAGIGIL (<u>SEQ ID NO:24</u>) | Schneider <i>et al.</i> 1998 |
| | B45 | AEEAAGIGILT (<u>SEQ ID NO:25</u>) | Schneider <i>et al.</i> 1998 |
| <i>MCIR</i> | A2 | TILLGIFFL | Salazar-Onfray <i>et al.</i> 1997 |
| | A2 | FLALIICNA | Salazar-Onfray <i>et al.</i> 1997 |
| <i>Gp100</i> | A2 | KTWGQYWQV | Bakker <i>et al.</i> 1995 |
| | A2 | AMLGTHTMEV (<u>SEQ ID NO:26</u>) | Tsai <i>et al.</i> 1997 |
| | A2 | MLGTHTMEV | Tsai <i>et al.</i> 1997 |
| | A2 | SLADTNNSLAV (<u>SEQ ID NO:27</u>) | Tsai <i>et al.</i> 1997 |
| | A2 | ITDQVPFSV | Kawakami <i>et al.</i> 1995 |
| | A2 | LLDGTTATLRL (<u>SEQ ID NO:28</u>) | Kawakami <i>et al.</i> 1994b |
| | A2 | YLEPGPVTA | Cox <i>et al.</i> 1994 |
| | A2 | VLYRYGSFSV (<u>SEQ ID NO:29</u>) | Kawakami <i>et al.</i> 1995 |
| | A2 | RLMKQDFSV | Kawakami <i>et al.</i> 1998 |
| | A2 | FLPRIFCSC | Kawakami <i>et al.</i> 1998 |
| | A3 | LIYRRRLMK | Kawakami <i>et al.</i> 1998 |
| | A3 | ALNFPGSQK | Kawashima <i>et al.</i> 1998 |
| | A3 | SLIYRRRLMK (<u>SEQ ID NO:30</u>) | Kawashima <i>et al.</i> 1998 |
| <i>PSA</i> | A3 | ALLAVGATK | Skipper <i>et al.</i> 1996 |
| | A24 | VYFFLPDHL | Robbins <i>et al.</i> 1997 |
| | Cw8 | SNDGPTLI | Castelli <i>et al.</i> 1999 |
| | A1 | VSHSFPHPLY (<u>SEQ ID NO:31</u>) | |
| <i>PSM</i> <i>Tyrosinase</i> | A2 | FLTPKKLQCV (<u>SEQ ID NO:32</u>) | Corman <i>et al.</i> 1998 |
| | A2 | VISNDVCAQV (<u>SEQ ID NO:33</u>) | Correale <i>et al.</i> 1997 |
| | A1 | HSTNGVTRIY (<u>SEQ ID NO:34</u>) | Corman <i>et al.</i> 1998 |
| | A1 | KCDICTDEY | Kittlesen <i>et al.</i> 1998 |
| | A1 | SSDYVPIGTY (<u>SEQ ID NO:35</u>) | Kawakami <i>et al.</i> 1998 |
| | A2 | YMDGTMSQV | Wölfel <i>et al.</i> 1994 |
| | A2 | MLLAVLYCL | Wölfel <i>et al.</i> 1994 |
| | A24 | AFLPWHRLF | Kang <i>et al.</i> 1995 |
| | B44 | SETWRDIDF | Brichard <i>et al.</i> 1996 |
| | A31 | MSLQRQFLR | Wang <i>et al.</i> 1996b |
| <i>TRP-1 (or</i> <i>gp75)</i> <i>TRP-2</i> | A2 | SVYDFFVWL | Parkhurst <i>et al.</i> 1998 |
| | A2 | TLDSQVMSL | Noppen <i>et al.</i> 2000 |
| | A31 | LLGPGRPYR | Wang <i>et al.</i> 1996a |
| | A33 | LLGPGRPYR | Wang <i>et al.</i> 1998a |
| | Cw8 | ANDPIFVVL | Castelli <i>et al.</i> 1999 |

^aTwo different groups simultaneously discovered this gene and gave it two different names, MART-1 and Melan-A respectively

[0050] The following table is from Renkvist *et al.* (2001).

Table 3 Class I HLA-restricted widely expressed antigens

| Gene | HLA | Peptide epitope | Tissue distribution | | Reference |
|-----------------|-----|--|--|--|------------------------------|
| | | | Tumors | Normal tissues | |
| <i>ART-4</i> | A24 | AFLRHAAL DYPSSLATDI (SEQ ID NO:36) | SCC, SCLC, H/N tumors, leukemia, lung, esophageal, gastric, cervical, endometrial, ovarian and breast carcinomas | Testis, placenta, fetal liver | Kawano <i>et al.</i> 2000 |
| <i>CAMEL</i> | A2 | MLMAQEALAF L (SEQ ID NO:37) | Melanoma | Testis, placenta, heart, skeletal muscle, pancreas | Aarnoudse <i>et al.</i> 1999 |
| <i>CEA</i> | A2 | YLSGANLNL (CAP-1) ^a | Melanoma | Testis, placenta, heart, skeletal muscle, pancreas | Tsang <i>et al.</i> 1995 |
| <i>CEA</i> | A3 | HLFGYSWYK | Colon, rectum, pancreas, gastric, breast and lung carcinomas | Gastrointestinal embryonic tissue | Kawashima <i>et al.</i> 1999 |
| <i>Cyp-B</i> | A24 | KFHRVIKDF DFMIQGGDF | Lung adenocarcinoma, T cell leukemia, lymphosarcoma – bladder, ovarian, uterine and esophagela SCC, | Ubiquitously expressed in normal tissues | Gomi <i>et al.</i> 1999 |
| <i>HER2/neu</i> | A2 | KIFGSLAFL | Melanoma – ovarian and breast carcinomas | Epithelial cells | Risk <i>et al.</i> 1995 |
| <i>HER2/neu</i> | A2 | IISAVVGIL | Melanoma, ovarian, pancreatic (Pieper <i>et al.</i> , 1999) ^b and breast carcinomas | Epithelial cells | Peoples <i>et al.</i> 1995 |
| <i>HER2/neu</i> | A2 | RLLQETELV | Melanoma, ovarian, gastric, pancreatic (Pieper | Epithelial cells | Kono <i>et al.</i> 1998 |

| | | | | | |
|---------------------------|-----|---|--|---|--------------------------------|
| | | | <i>et al.</i> , 1999) and breast carcinomas | | |
| <i>HER2/neu</i> | A2 | VVLGVVFGI ILHNGAYSL YMIMVKCWMI <u>(SEQ ID NO:38)</u> | Melanoma, ovarian, gastric, pancreatic (Pieper <i>et al.</i> , 1999) and breast carcinomas | Epithelial cells | Rongcun <i>et al.</i> 1999 |
| <i>HER2/neu</i> | A3 | VLRENTSPK | Melanoma, ovarian, gastric, pancreatic (Pieper <i>et al.</i> , 1999) and breast carcinomas | Epithelial cells | Kawashima <i>et al.</i> 1999 |
| <i>HTERT</i> ^c | A2 | ILAKFLHWL | Lung, and ovarian carcinomas – multiple myeloma, melanoma, sarcoma, acute leukemias, non-Hodgkin's lymphomas | Hematopoietic stem cells and progenitors; germinal center cells; basal keratinocytes; gonadal cells; certain proliferating epithelial cells | Vonderheide <i>et al.</i> 1999 |
| <i>HTRT</i> ^c | A2 | ILAKFLHWL RLVDDFLLV | Lung, prostate and ovarian carcinomas, multiple myeloma, melanoma, sarcoma, acute leukemias, non-Hodgkin's lymphomas | Circulating B cells; germinal center B cells; thymocytes; CD34+ progenitor hemopoietic cells | Minev <i>et al.</i> 2000 |
| <i>iCE</i> | B7 | SPRWWPTCL | RCC | Kidney, colon, small intestine, liver, heart, pituitary gland, adrenal gland, prostate, stomach | Ronsin <i>et al.</i> 1999 |
| <i>MUC1</i> | A11 | STAPPAHGV | Breast and ovarian carcinomas, multiple myeloma, B-cell carcinoma, multiple myeloma | None ^d | Domenech <i>et al.</i> 1995 |
| <i>MUC1</i> | A2 | STAPPVHNV | Breast and ovarian carcinoma, multiple myeloma, B-cell lymphoma | None ^d | Brossart <i>et al.</i> 1999 |
| <i>MUC2</i> | A2 | LLNQLQVNL MLWGWREHV | Ovary, pancreas and breast | Colon, small intestine, | Böhm <i>et al.</i> 1998 |

| | | | | | |
|---------------|------------|---|---|---|--|
| | | | mucinous tumors, colon carcinoma of non-mucinous type | bronchus, cervix and gall bladder | |
| <i>PRAME</i> | A24 | LYVDSLFFL | Melanoma, H/N and lung SCC, NSCLC (van Baren <i>et al.</i> , 1998), RCC, adenocarcinoma, sarcoma, leukemias | Testis, endometrium, ovary, adrenals, kidney, brain, skin | Ikeda <i>et al.</i> 1997 |
| <i>P15</i> | A24 | AYGLDFYIL | Melanoma | Testis, spleen, thymus, liver, kidney, adrenal tissue, lung tissue, retinal tissue | Robbins <i>et al</i> 1995 |
| <i>RU1</i> | B51 | VPYGSFKHV | Melanoma, renal and bladder carcinomas | Testis, kidney, heart, skin, brain, ovary, liver, lung, lymphocytes, thymus, fibroblasts | Morel <i>et al.</i> 2000 |
| <i>RU2</i> | B7 | LPRWPPPQL | Melanoma, sarcomas leukemia – brain, esophageal and H/N tumors – renal, colon, thyroid, mammary, bladder, prostatic and lung carcinomas | Testis, kidney, liver, urinary bladder | Van den Eynde <i>et al.</i> 1999 |
| <i>SART-1</i> | A24 | EYRGFTQDF | Esophageal, H/N and lung SCC – adenocarcinoma, uterine cancer | Testis, fetal liver | Kikuchi <i>et al.</i> 1999 |
| <i>SART-1</i> | A*26 01 | KGSGKMKTE | Esophageal, H/N and lung SCC, adenocarcinoma, uterine cancer | Testis, fetal liver | Shichijo <i>et al.</i> 1998 |
| <i>SART-3</i> | A24 | VYDYNCHVDL (SEQ ID NO:39) AYIDFEMKI | H/N, esophageal and lung SCC, adenocarcinoma, | Lymphoid cells, fibroblasts, testis, fetal liver | Yang <i>et al</i> 1999 |

| | | | | | |
|------------|----|-----------|---|----------------------------------|---------------------------|
| | | | leukemia, melanoma | | |
| <i>WT1</i> | A2 | RMFPNAPYL | Gastric, colon, lung, breast, ovary, uterine, thyroid and hepatocellular carcinomas – leukemia (including AML, ALL and CML) | Kidney, ovary, testis, spleen | Oka <i>et al.</i> 2000 |

^aCAP-1 is an alternative name of this peptide

^bTissue distribution among tumors as described in the given references when different from the paper first reporting the sequence of the epitope

^cTelomerase is expressed in most human tumors: those listed were shown to be susceptible to lysis by cytotoxic T lymphocytes

^dAll epithelial tissues express mucin-like hyperglycosylated molecules

[0051] The following table is from Renkvist *et al.* (2001).

TABLE 4. CLASS I HLA-RESTRUCTURED TUMOR-SPECIFIC ANTIGENS, INCLUDING BOTH UNIQUE (CDK-4, MUM-2, β -CATENIN, HLA-A2-R170I, ELF2 M, MYOSIN-M, CASPASE-8, KIAA0205, HSP70-2M) AND SHARED (CAMEL, TRP-2/INT2, GNT-V 250, ANTIGENS

| Gene | HLA allele | Peptide epitope | <u>Tissue distribution</u> | | Reference |
|------------------------|------------|---|---|-----------------------------------|--------------------------------|
| | | | Tumors | Normal tissues | |
| <i>AFP</i> | A2 | GVALQTMKQ | Hepatocellular carcinoma | Fetal liver | Butterfield <i>et al.</i> 1999 |
| β -Catenin/m | A24 | SYLDSGIH | Melanoma | None | Robbins <i>et al.</i> 1996 |
| <i>Caspase-8/m</i> | A2 | FPSDSWCYF | H/N tumors | None | Mandruzzato <i>et al.</i> 1997 |
| <i>CDK-4/m</i> | A2 | ACDPHSGHFV (SEQ ID NO:40) | Melanoma | None | Wöfel <i>et al.</i> 1995 |
| <i>ELF2 M</i> | A68 | ETVSEQSNV | Lung SCC | None | Hogan <i>et al.</i> 1998 |
| <i>GnT-V</i> | A2 | VLPDVFIRC(V) ^a (SEQ ID NO:41) | Melanoma, brain tumors, sarcoma | Breast and brain (low expression) | Guilloux <i>et al.</i> 1996 |
| <i>G250</i> | A2 | HLSTAFARV | RCC, colon, ovarian and cervical carcinomas | None | Vissers <i>et al.</i> 1991 |
| <i>HSP70-2M</i> | A2 | SLFEGIDIV | RCC, melanoma, neuroblastoma | None | Gaudin <i>et al.</i> 1999 |
| <i>HA-A*0201-R170I</i> | A2 | CVEWLRIYLE- NGK (SEQ ID NO:42) | RCC | None | Brändle <i>et al.</i> 1996 |
| <i>HST-2</i> | A31 | YSWMDISCWI | Gastric signet cell | None | Suzuki <i>et al.</i> 1999 |

| | | <u>(SEQ ID NO:43)</u> | carcinoma | | |
|-------------------|--------|--|--|-------------------|----------------------------|
| <i>KIAA0205</i> | B44*03 | AEPINIQTV | Bladder cancer | None | Gueguen <i>et al.</i> 1998 |
| <i>MUM-1</i> | B44 | EEKLIVVLF | Melanoma | None | Coulie <i>et al.</i> 1995 |
| <i>MUM-2</i> | B44 | SELFRSGLDY <u>(SEQ ID NO:44)</u> | Melanoma | None | Coulie <i>et al.</i> 1995 |
| <i>MUM-2</i> | Cw6 | FRSGLDSYV | Melanoma | None | Chiari <i>et al.</i> 1999 |
| <i>MUM-3</i> | A28 | EAIFIQPITR | Melanoma | None | Baurain <i>et al.</i> 2000 |
| <i>Myasin/m</i> | A3 | KINKNPKYK | Melanoma | None | Zorn and Hercend, 1999a |
| <i>RAGE</i> | B7 | SPSSNRIRNT <u>(SEQ ID NO:45)</u> | Melanoma, sarcomas, mesotheliomas, H/N tumors, bladder, renal, colon and mammary carcinomas | Retina only | Gaugler <i>et al.</i> 1996 |
| <i>SART-2</i> | A24 | DYSARWNEI | H/N and lung SCC, lung adenocarcinoma, RCC, melanoma, brain tumors, esophageal and uterine cancers | None | Nakao <i>et al.</i> 2000 |
| <i>TRP-2/INT2</i> | A68 | AYDFLYNYL SYTRLFLIL EVISCKLIK <u>(SEQ ID NO:46)</u> | Melanoma | None | Lupetti <i>et al.</i> 1998 |
| 707-AP | A2 | RVAALARDA | Melanoma | None ^b | Morioka <i>et al.</i> 1995 |

^a VLPDVFIRC(V) = nonamer and decamer peptides are both recognized by CTLs

^b This antigen is not expressed in normal cells but, as the tissue of the testis was not tested, it will not become clear to which category the antigen may belong until more information is available

[0052] The following table is from Renkvist *et al.* (2001).

TABLE 5. CLASS II HLA-RESTRICTED ANTIGENS

| Gene | HLA allele | Peptide epitope | <u>Tissue distribution</u> | | Reference |
|---------------------------------------|----------------------|---|---|------------------|---------------------------|
| | | | Tumors | Normal tissues | |
| Epitopes from normal protein antigens | | | | | |
| <i>Amexin II</i> | DRB*0401 | DVPKWISIM-TERSVPH <u>(SEQ ID NO:47)</u> | Melanoma | Not done | Li <i>et al.</i> 1998 |
| <i>Gp100</i> | DRB1*0401 | WNRQLYPE- WTEAQRLD <u>(SEQ ID NO:48)</u> | Melanoma | Melanocytes | Li <i>et al.</i> 1998 |
| <i>MAGE-1, -2, -3, -6</i> | DRB*1301 DRB*1302 | LLKYRARIP- VTKAE <u>(SEQ ID NO:49)</u> | Melanoma, lung and breast carcinomas, H/N SCC | Testis, placenta | Chaux <i>et al.</i> 1999a |
| <i>MAGE-3</i> | DR*11-1 | TSYVKVLHHM-VKISG | Melanoma, lung and | Testis, | Manici <i>et</i> |

| | | <u>(SEQ ID NO:50)</u> | | | |
|----------------------------|--------------------|--|---|---------------------|--|
| <i>MAGE-3</i> | DRB*1301 | AELVHFLLLK- | breast carcinomas, H/N SCC | placenta | <i>al.</i> 1999 |
| | DRB*1302 | YRAR <u>(SEQ ID NO:51)</u> | Melanoma, lung and breast carcinomas, H/N SCC | Testis, placenta | Chaux <i>et al.</i> 1999b |
| <i>MART-1 /Melan-A</i> | DRB1*0401 | RNGYRALMDKS- LHVGTQCALTRR <u>(SEQ ID NO:52)</u> | Melanoma | Melanocytes | Zarour <i>et al.</i> 2000 |
| <i>MUC1</i> | DR3 | PGSTAPPAHGVT <u>(SEQ ID NO:53)</u> | Breast and ovarian cancers; multiple myeloma, B-cell lymphoma | None ^a | Hitbold <i>et al.</i> 1998 |
| <i>NY-ESO-1</i> | DRB4*0101 | VLLKEFTVSG <u>(SEQ ID NO:54)</u> | Melanoma, B- lymphoma, hepatoma (Chen <i>et al.</i> , 1997) ^b , sarcoma, H/N tumors, - bladder, lunch, prostate, ovarian, thyroid and breast carcinomas | Testis | Zeng <i>et al.</i> 2000 |
| <i>NY-ESO-1</i> | DRB4*0101 -0103 | PLPVPGVLLK- EFTVSNGI <u>(SEQ ID NO:55)</u> VLLKEFTVSG- NILTIRLT <u>(SEQ ID NO:56)</u> AADHRQLQL- SISSCLQQL <u>(SEQ ID NO:57)</u> | B-Lymphoma, melanoma, sarcoma, H/N tumors, hepatoma (Chen <i>et al.</i> , 1997) - bladder, lung, prostate, ovarian, thyroid and breast carcinomas | Testis | Jäger <i>et al.</i> , 2000 |
| <i>PSA</i> | DR4 | ILLGRMSLFM- PEDTG <u>(SEQ ID NO:58)</u> SLFHPEDTGQVFQ <u>(SEQ ID NO:59)</u> QVFQVSHSFPHPLYD <u>(SEQ ID NO:60)</u> NDLMLLRLSEPAELT <u>(SEQ ID NO:61)</u> KKLQCVQLHVISM <u>(SEQ ID NO:62)</u> GVLQGITSMGSEPCA <u>(SEQ ID NO:63)</u> | Melanoma | Melanocytes | Corman <i>et al.</i> 1998 |
| <i>Tyrosinase</i> | DRB1*0401 | QNIILSNAPLGPQFP <u>(SEQ ID NO:64)</u> DYSYLQDSDPD- SFQD <u>(SEQ ID NO:65)</u> SYLQDSDPDSFQD <u>(SEQ ID NO:66)</u> | Melanoma | Melanocytes | Topalian <i>et al.</i> 1994 Topalian <i>et al.</i> 1996 |
| <i>Tyrosinase</i> | DRB1*1501 | RHRPLQEYYP- EANAPIGHNRE <u>(SEQ ID NO:67)</u> | Melanoma | Melanocytes | Kobayashi <i>et al.</i> 1998a |
| <i>Tyrosinase</i> | DRB1*0405 | EIWRDIDFAHE <u>(SEQ ID NO:68)</u> | Melahoma | Melanocytes | Kobayashi <i>et al.</i> 1998b |

Epitopes from mutated protein antigens

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|----------------|-----------|--|---------------------|------|---------------------------|
| <i>HPV-E7</i> | DR*0401 | LFMDTLSFVCPLC <u>(SEQ ID NO:69)</u> | Cervical carcinomas | None | Höhn <i>et al.</i> 1999 |
| | DR*0407 | LFMDSLNFVCPWC <u>(SEQ ID NO:70)</u> | | | |
| <i>CDC27/m</i> | DRB1*0401 | FSWAMDLDPKGA <u>(SEQ ID NO:71)</u> | Melanoma | None | Wang <i>et al.</i> 1999a |
| <i>TPI/m</i> | DRB1*0101 | GELIGILNAAKVPAD <u>(SEQ ID NO:72)</u> | Melanoma | None | Pieper <i>et al.</i> 1999 |

^a All epithelial tissues express highly glycosilated mucins whereas tumor cells often show hypoglycosilated mucins with a normal protein sequence.

^b Tissue distribution among tumors as described in the given references when different from the paper first reporting the sequence of the epitope.